

Sustainable Agricultural Development

Indigenous Technical Knowledge (ITK)

ITK means these knowledge that are using by farmers generation after generation in Bangladesh. It is the traditional knowledge of the farmers of Bangladesh in the production, protection and preservation of crops generated by their own and by the local people.

It is the local knowledge that is unique to given culture of society. It is the basis for local level decision making in agriculture, health-care, food preparation, educational, natural resources management and host of other activities in rural communities.

Objectives

- ▶ To keep sound environment.
- ▶ No cost of pesticides.
- ▶ No health hazards.
- ▶ No pollution occur.
- ▶ Less labour cost.
- ▶ Use of local materials.

Commonly used ITK

A. Agriculture:

1. Spreading tobacco dust over the field to control insect.
2. Applying fish cleaning water at the base of leguminous (bean) and cucurbits to get benefit.
3. De-topping aus rice plants when the vegetative growth is vigorous.
4. Setting up bamboo sticks or branches of trees in rice field to sit down the birds and eat away insects which helps to control insect infestation.
5. Hand pollination of kakrol, cucurbit flowers for getting round and unique fruits.
6. Spraying Neem solution on the vegetables to control insects.
7. Inter-cropping garlic and potato to minimise pest attack.
8. Spreading Ash in vegetables field to control aphid.
9. Spraying cowdung mixed water in the field to prevent the attack of cattle and goat.

B. Fishery

1. Applying cow dung to feed the fish.
2. Applying oil cakes in the pond to feed the fish.
3. Applying rice kura (rice husk) in the pond.
4. Applying lime in the pond to clean the unclean water.
5. Using banana leaves in the pond to feed grass carp.

C. Livestock

1. Feeding garlic mixed with cowdung to chicken to control 'Ranikhet' disease.
2. Feeding birth controlling tablet (Maya tablet) to chicken for controlling "Ranikhet" disease.
3. Feeding rice mixed with KMnO_4 to chicken for controlling cure poul chlorera.
4. Feeding the flesh of molluscus to duck for Rapid growth.
5. Feeding the katanotey grass to livestock for improving lactation.

Importance of ITK

1. ITK is easy skill and experience dependence. So the people of a community can solve their problems easily.
2. Many ITK have scientific value. ITK may use for scientific research.
3. It is subjective and linked with farming and involve low cost input use.
4. ITK is eco-friendly for agricultural system.
5. ITK of a specific Community help the extension worker to measure the depth of knowledge.
6. The knowledge are localised and situation specific. So ITK help the farmer to take decision in their own way.

Limitations

1. ITK have been passed from generation to generation orally. Errors are bound to creep in ITK in the absence of proper documentation.
2. Many of the ITK passed on to the community members in the form of proverbs, folklores and folk song. So many time member cannot remember them easily.
3. The scientific community does not accept them because many of them have not scientific interpretation.
4. ITK fail to hand up to the scientific rationality and hence modern Technology lost of many ITK.

ICM (Integrated Crop Management)

Definition

- ▶ Integrated crop management (ICM) is a holistic approach to sustainable agriculture. It considers the situation across the whole farm, including socio-economic and environmental factors to deliver the most suitable and safe approach for long-term benefit.
- ▶ ICM is a pragmatic (রাষ্ট্রীয়) approach to the crop production which include IPM, soil, social and environmental management.
- ▶ ICM is a method of farming that balances the requirements of a running profitable business with responsibility and sensitivity to the environment. It includes practices that avoid waste, enhance Energy Efficiency and minimise pollutions.

Principles

- ✓ Production of healthy and profitable crops.
- ✓ Regular field visit/observation.
- ✓ Production of environmentally friendly crops.
- ✓ To help farmers to take a decision.

Components of Integrated Crop Management for Field Crops

1. **Quantify nutrient source:** soil reserve, manure, crop residue.
2. **Soil test:** pH, lime requirement, phosphorous, potassium (calcium and magnesium optional).
3. **Manure analysis:** nitrogen (ammonium N, total N), phosphorus, potassium.
4. **Calibration manure and fertilizer spreaders:** tons, 1000's gallons, lbs. per acre.
5. **Fertilization plan:**
 - Manure application rate, supplemental fertilizer.
 - Utilize excess manure on alternative crops (hay crops).
 - Avoid applying large amounts of manure on fields with excessive P soil tests.
 - Do not over apply nitrogen from manure or fertilizer.
6. **Nitrogen soil test:** side- or top-dressing supplemental nitrogen fertilizer.
7. **Cover crop:**
 - To reduce soil loss and nitrate leaching; optimal cover when planted by September 15, little value after September 30.
 - Consider a legume based cover crop on vegetable farms and on distant fields on dairy farms where manure is not spread.

8. Planting plan: to ensure early harvest of corn to allow early cover crop planting on most erosion prone (প্রবণ) fields.

9. Minimum tillage: to reduce nutrient loss through soil erosion.

Sustainable Agriculture

➡ Sustainable agriculture is the successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the quality of the environment and conserving natural resources (CGIAR, 1988).

➡ Sustainable agriculture is those farming system which minimise the use of external inputs and minimise the use of internal inputs already existing on the farm (Carter, 1989).

➡ Sustainable agriculture is those agricultural Systems that are environmentally sound, profitable and productive and that maintain the social fabric (কাঠামো) of the rural community (Keeny, 1989).

Criteria of Sustainable agriculture

The criteria of Sustainable agriculture are given below-

► Ecological criteria

1. Balance use of nutrients.
2. Efficient use of soil, water and genetic resources.
3. Need based external inputs.
4. Minimal negative environmental impacts.

► Economic criteria

1. Sustained farmers livelihood.
2. Competitiveness.
3. Efficient use of production factors.
4. Low relative value of external inputs.

► Social criteria

1. Widely acceptable and equitable (ন্যায়সঙ্গত) adoption potential among farmers.
2. Reduced dependence on external institution.
3. Respecting and building ITKs, beliefs and value system.
4. Contribution on Employment generation.